



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/051,995	01/18/2002	Thomas E. McWhorter	CDG-101US	9137
35775	7590	10/11/2006		
DESIGN IP, P.C. 5100 W. TILGHMAN STREET SUITE 205 ALLENTOWN, PA 18104				
EXAMINER NGUYEN, NGOC YEN M				
ART UNIT 1754				
PAPER NUMBER				

DATE MAILED: 10/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/051,995

Applicant(s)

MCWHORTER ET AL.

Examiner

Ngoc-Yen M. Nguyen

Art Unit

1754

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 June 2006.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 3-38 is/are pending in the application.  
4a) Of the above claim(s) 30-37 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1, 3-29, 38 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

Claim 38 is objected to because of the following informalities: the "90% by volume" should be changed to "90% by weight". Appropriate correction is required.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 3-29, 38 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In the instant specification, one aspect of the claimed invention is to permit at least 90% by weight of the alkali metal chlorate to react with the inorganic acid to produce gaseous chlorine, chlorine dioxide and steam (note page 10, last paragraph). The instant specification also discloses that hydrochloric acid and sodium chlorate participate in two competing reactions (note the two reactions at the top of page 6). However, it is stated that "[T]hese goals are achieved by mixing the reagents in approximately stoichiometric ratios to complete both the reaction that favors production of chlorine dioxide and the competing reaction that produces chlorine but no chlorine

dioxide" (note paragraph bridging pages 12-13). Since the stoichiometric ratios in these two reactions are different, it is unclear how the stoichiometric ratios can be selected to satisfy both reactions. Since it is unclear how the stoichiometric ratios can be selected, it is also unclear how to ensure "at least 90wt% by weight of the alkali metal chlorate" is reacted with inorganic acid.

It is also disclosed that "the reactors are sized so that, at the maximum production rate, the reaction is essentially complete when the solution exits each stage of the process" (note page 16, lines 8-11) and "[I]f the process is designed so that the ratios of the raw materials (e.g. HCl/chlorate solution) injected into each section is constant and the production rate is controlled by the rate at which reagents are added to the reactor in this proportion, then the ratio of products (chlorine/chlorine dioxide) produced in the reactor segment will be constant so long as the reactor is sized so that the reaction is essentially complete before the reacting solution exits the reactor (note page 19, lines 21-26), however, because it is unclear how the ratio of the raw materials is selected, how to ensure the reaction is completed, then it would also be unclear how the reactor is sized or how to control the ratio of products.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 10, 16-17, 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 10, there is no antecedent basis for "said reactors" (plural form). It should be noted in claims 1 and 8, only "a reactor" is required.

In claims 16-17, it is unclear what is required by "to one of".

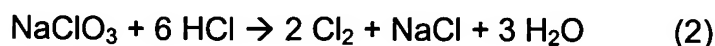
The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3 are rejected under 35 U.S.C. 102(b) as being anticipated by Bielz et al (4,372,939).

Bielz '939 a process for producing chlorine dioxide wherein alkali metal chlorate solution is reacted with hydrochloric acid in a reactor through which air stream is passed countercurrent to the alkali metal chlorate (note claim 1). Bielz '939 teaches that the efficiency of the process depends on the following reactions:



Normally, the reaction expressed by equation (1) predominates. The reaction expressed by equation (2) increases as the chloride concentration increases (note column 1, lines 45-57). The chlorine dioxide reactor would have an efficiency of 100% if there were no reactions according to reaction (2). Thus, when the reaction has an

Art Unit: 1754

efficiency of 92% as stated below, the final product would be a mixture of chlorine dioxide and chlorine.

As disclosed in the sole Example, 8 metric ton of chlorine dioxide are produced from 13.76 metric tons of alkali metal chlorate with an efficiency of 92%. This value is within the claimed range of "at least 90%". The chlorine dioxide is absorbed into an aqueous solution in an absorber (note the Figure, absorber 3).

The process of Bielz '939 anticipates the claimed process.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-13, 21, 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bielz '939, optionally further in view of Kesting (2,664,341) and Rosenblatt et al (6,716,354).

Bielz '939 discloses a process of producing chlorine dioxide as stated in the above rejection.

The difference is Bielz '939 does not specifically disclose the process conditions, such as the concentration of the HCl, the initial concentration of the alkali metal chlorate, etc. However, it would have been obvious to one of ordinary skill in the art to

Art Unit: 1754

optimize these process conditions for the process of Bielz '939 in order to obtain the best results.

Bielz '939 further discloses that chlorine dioxide is normally produced where it is used (note column 1, lines 8-10). Since chlorine dioxide is a well known disinfectant, it would have been obvious to one of ordinary skill in the art to use the chlorine dioxide solution produced by Bielz '939 in any known and conventional disinfecting process.

Optionally, Kesting '341 can be applied to teach the use of multiple vessels in the process of producing chlorine dioxide.

Optionally, Rosenblatt '354 can be applied to teach the use of a mixed stream of chlorine and chlorine dioxide, sometimes with ammonia, to disinfect and preoxidize drinking water while minimize production of THMs and HAAs (note column 2, lines 50-54).

It would have been obvious to one of ordinary skill in the art to optimize the process condition in Bielz '939 in order to obtain a mixture of chlorine and chlorine dioxide as suggested by Rosenblatt '354 because such mixed stream would interact in synergistic ways to accomplish disinfection of drinking water (note Rosenblatt '354, column 5, lines 16-21).

Applicant's arguments filed June 26, 2006 have been fully considered but they are not persuasive.

Applicants argue that the opinion of a recognized expert should be give great deference especially in view of the fact that there is no countervailing evidence put forth by the examiner.

The reasons for the 112, 1<sup>st</sup> paragraph rejection is clearly explained above. In the instant application, it is disclosed how to control the chlorine/chlorine dioxide ratio (note for example, page 19, last paragraph, page 22, middle paragraph), however, there is no disclosure regarding how to permit at least 90% by weight of the alkali metal chlorate to react with the inorganic acid to produce gaseous chorine, chlorine dioxide and steam (note page 10, "In another aspect" paragraph). Applicants discloses that "these goals", which assume to include the "at least 90% by weight" aspect, by "mixing the reagents in approximately stoichiometric ratios to complete both the reaction that favors production of chlorine dioxide and the competing reaction that produces chlorine but no chlorine dioxide", however, there is no disclosure as what should be the "stoichiometric ratios" because two reactions require two different stoichiometric ratios. It is also noted that the opinion of an expert may not reflect the skill of one of ordinary skill in the art.

Applicants argue that Bielz discloses that reaction 2 (which produces chlorine) is undesirable.

Granted that it is true, however, Bielz still discloses that the process is only 92% efficiency, and the product of Bielz would contain some chlorine. For Applicants' claims 1, 3, no minimum amount is required for the chlorine in the product.



Applicants argue that none of the prior art discloses a process for carrying the reactions essentially to completion.

Bielz fairly teaches the reactions are carried out at least to 92% completion as stated in the above rejection.

Applicants argue that Kesting is concerned with producing chlorine dioxide, not a mixture of chlorine and chlorine dioxide.

Kesting is applied to teach that multiple vessels can be used, not to teach a mixture of chlorine and chlorine dioxide.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc-Yen M. Nguyen whose telephone number is (571) 272-1356. The examiner is currently on Part time schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Stanley Silverman can be reached on (571) 272-1358. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 or (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed (571) 272-1700.

  
Ngoc-Yen M. Nguyen  
Primary Examiner  
Art Unit 1754

nmn  
October 2, 2006